



RECEIVED

16 JUN -8 PM 1:03

614 Magnolia Avenue
Ocean Springs, Mississippi 39564
Phone 228.818.9626
Fax 228.818.9631
www.anchorqea.com

MEMORANDUM

SUPERFUND DIV
REMEDIAL BR
(6SF-R)

To: Gary Miller
U.S. Environmental Protection Agency

Date: June 6, 2016

From: Wendell Mears, David Keith, John Verduin, John Laplante, Holly Samaha, and Rick Coupe
Anchor QEA, LLC

Project: 150557-01.01

Cc: Dave Moreira, MIMC
Phil Slowiak, IP

Re: TCRA Armored Cap - Response to Request Regarding Dive Team Summary Report for April 3-9, 2016

INTRODUCTION

This document was prepared in response to your email of May 24, 2016 (May 24 Email) regarding the United States Environmental Protection Agency (USEPA) Dive Team (Dive Team) Summary Report for April 3-9, 2016 (Dive Team Summary Report, Attachment 1). The email stated that the Dive Team, during its April 2016 inspection at the TCRA Site, "found areas located in the west part of the cap where the armor rock was missing." It requested that Respondents McGinnes Industrial Maintenance Corporation and International Paper Company (Respondents) prepare a work plan for USEPA review related to the Dive Team Summary Report's findings (Dive Team Findings). As noted below, Respondents conducted an independent investigation and were unable to verify the Dive Team Findings.

Anchor QEA, LLC (Anchor QEA) completed independent inspections of the areas of interest (AOIs) described in the Dive Team Summary Report, first while the Dive Team was on-site from April 4-7, 2016 (Dive Team Inspection) and then on two days in May 2016 while the Dive Team was installing porewater samplers at the TCRA Site. These inspections were led by Wendell Mears of Anchor QEA. Mr. Mears has degrees in Civil, Ocean and Coastal Engineering. He had a 21-year career with the U.S. Army Corps of Engineers and has more than 30 years of experience in marine and coastal engineering and construction. He has conducted numerous marine sediment probing events throughout his career, including many such events on the Houston Ship Channel and tributaries.

9490538



Anchor QEA's independent investigation did not confirm the Dive Team Findings or identify the need for maintenance activities in any of the AOIs described in the Dive Team Summary Report. Given the differences between Anchor QEA's conclusions and the Dive Team Findings, and in order to confirm conditions within the AOIs, Respondents propose as a next step that representatives of Respondents and USEPA conduct a joint inspection of the AOIs. Any maintenance that may be required could then be performed immediately following the joint inspection, using locally stockpiled materials and procedures that were used in other recently completed maintenance events.

This memorandum summarizes the inspection and probing activities conducted on behalf of the Respondents with respect to the AOIs identified in the Dive Team Summary Report.

Dive Team's Initial Identification of AOIs

The AOIs, located within the Western Cell of the TCRA Armored Cap (Figure 1), were first reported to Anchor QEA field personnel who were supporting the Dive Team members on April 4, 5, 6, and 7, 2016, as they were identified. During the Dive Team Inspection, the Dive Team provided coordinates of the AOIs to the Anchor QEA support personnel that are consistent with the locations identified in the Dive Team Summary Report.

Cap Probing and Verification During Dive Team Inspection – Thursday, April 7, 2016

On April 7, 2016, Wendell Mears of Anchor QEA and a Benchmark Ecological Services Inc. (BESI) probing crew conducted probing by boat at certain AOIs that were determined to be atop the TCRA armored cap. The Dive Team was present in another boat during the probing activities. During the course of the day, the results of the probing being conducted by Anchor QEA and BESI were shared with Dive Team members.

Verification probing began at the locations designated AOI-3, 4, 8, 9, 9a, 9b, and 10 (Figure 1). Probing was conducted from a BESI vessel using three probes. The first probe was a ½ inch x 10 foot steel rebar, the second probe was a 1 inch x 10 foot plastic pipe and the third probe was a three piece 2 inch diameter aluminum pipe in 12 foot segments. The aluminum probe could be coupled to provide a 36 foot long probe in deep water. Each AOI was probed at the prescribed location and then 3 to 5 feet away from that location in all principal

directions (north, south, east, and west). The probing was conducted in accordance with procedures in a work plan (Anchor QEA 2016) submitted to USEPA on March 15, 2016, for a prior TCRA cap probing inspection and approved by USEPA on March 16, 2016.

At each AOI, Mr. Mears was able to verify that armored cap material was present at the specified thickness. At AOI-8, 9, 9a, 9b, and 10, 1 to 2 feet of sediments were present above the underlying armored cap material. These results, as described in Table 1, were shared with the Dive Team. A member of the Dive Team indicated that they did not find any armored cap materials at any of these AOIs.

Mr. Mears then moved to the cluster of AOIs designated AOI-15-2A, 15-2B, 16, 17, 18, and 19. These AOIs cover an area of approximately 600 square feet. After probing for approximately one hour, Mr. Mears delineated what appeared to be two natural depressions that were present in the pre-TCRA cap surface at these locations. He identified a continuous layer of cap materials (aggregate and sands) that was present below softer depositional materials. Mr. Mears sketched the areas he had identified on a sheet of paper and then discussed it with the Dive Team members. One member of the Dive Team asked to go back to that location on the probing boat. Mr. Mears asked her to probe the area with both a 10 foot solid metal and 10 foot plastic pipe rod. After some training provided by Mr. Mears, she was able to differentiate sand, aggregate and muds using the two probes. She commented that differentiating materials was possible, but she would need additional training to be proficient and confident of her results.

Mr. Mears resumed probing at AOI-20. At that location, he confirmed that armored cap material was present at the specified thickness below an accumulation of sediments that had been deposited on the surface of the armored cap since the armored cap was installed in 2011. He shared this information with Dive Team members. When asked about the schedule for completing its inspections, the Dive Team leader stated that the Dive Team would be regrouping in Dallas to develop a better plan to resume and complete the dive inspection.

The April 7, 2016 probing inspection did not identify any locations requiring maintenance pursuant to the Operations, Monitoring, and Maintenance (OMM) Plan. The results of the probing conducted by Anchor QEA and BESI on April 7, 2016 are summarized in Table 1.

Probing Inspection – Wednesday, May 18, 2016 and Friday, May 20, 2016

An additional confirmatory probing event was conducted on behalf of Respondents by Anchor QEA and BESI staff on May 18 and May 20, 2016. The additional confirmatory probing was conducted at each of the AOIs identified during the Dive Team Inspection, following procedures in the work plan USEPA had previously approved for a prior TCRA cap probing inspection (Anchor 2016).

All AOIs identified by the Dive Team, except those identified as falling outside the boundaries of the original 1966 impoundment perimeter (as shown on Figure 1), were probed at the coordinates provided by the Dive Team and up to 5 feet away in all principal directions (north, south, east, and west) with the intent of identifying cap material presence and thickness. The AOIs were accessed by wading, and by vessel. A ½ inch × 10 foot steel rebar, a 1 inch × 10 foot plastic pipe, and three pieces of 2 inch × 12 foot aluminum pipe were utilized as probes to characterize each of the AOIs.

The field team executed the probing by proceeding to each AOI utilizing a Differential Global Positioning System (DGPS) unit with preloaded coordinates, establishing the water depth in the immediate area of the probing location, and then working the selected probe rod or rods to identify and measure the thickness of the armored cap material or until refusal was encountered. After locating an AOI, an assessment of the total thickness of the cap material was made. At each AOI, the cap thickness or the depth to refusal was recorded and compared to the construction specifications for the armored cap in that area. All AOIs were found to have equal to or greater than the required thickness of armor cap material.

The second independent cap investigation conducted by Anchor QEA found similar results to the April 7, 2016, cap investigation event and similarly did not confirm the Dive Team Findings or identify the need for maintenance activities in any of the AOIs pursuant to the OMM Plan. The results of the May 2016 probing event are summarized in Table 2.

Recommended Path Forward

The findings in the Dive Team Summary Report are not supported by the results of the three days of inspections performed by Anchor QEA. As such, there is no basis for the submission of a work plan to perform maintenance in any of the AOIs identified in the Dive Team Summary Report. Respondents instead propose that representatives of Respondents and USEPA conduct a joint probing inspection of the AOIs identified in the Dive Team Summary Report. This will provide a basis to confirm conditions in each AOI and to determine if maintenance is required in any location. Should any maintenance be required, it could then be performed immediately following the joint probing inspection, using locally stockpiled materials and procedures that were implemented for purposes of recent maintenance events.

FIGURES

Figure 1 – AOIs Identified During USEPA Dive Inspection

TABLES

Table 1 – April 2016 Anchor QEA Probing Results

Table 2 – May 2016 Anchor QEA Probing Results

ATTACHMENTS

Attachment 1 – EPA R6 Dive Team Operations Summary Report

REFERENCES

Anchor QEA, 2016. Plan for Additional Cap Probing on the Time Critical Removal Action Armored Cap, San Jacinto River Waste Pits Superfund Site, Channelview, Texas. March 15, 2016.

USEPA, 2010. *Administrative Settlement Agreement and Order on Consent for Removal Action*. U.S. Environmental Protection Agency Region 6 CERCLA Docket No. 06-03-10. In the matter of: San Jacinto River Waste Pits Superfund Site Pasadena, Harris County, Texas. International Paper Company and McGinnes Industrial Management Corporation, Respondents.

TABLES

Table 1
April 2016 Anchor QEA Probing Results

Location	USEPA Waypoint	Date	Notes
1	AOI-001 and 002	4/7/2016	Shown west of the cap limits; did not probe or verify.
2	AOI-003	4/7/2016	Nosed bow of the boat near waypoint. Probed waypoint and location shown approximately 10 feet north. Both locations had more than 1.0 feet of aggregate cap. Used steel probe rod to "rake" the cap on approximate one foot centers, pulling probe to the boat. Encountered aggregate cap surface on all raking pulls. See field notes and Figure 1.
3	AOI-004	4/7/2016	Nosed the bow ashore. Waypoint and locations 1 foot in all primary directions have cap materials equal to or greater than 1.5 feet. Used probe rod to "rake" on both sides of the vessel on approximate one foot intervals. Found cap materials at the surface on the slope and the shelf.
4	AOI-005, 006, and 007	4/7/2016	Shown west of the cap limits; did not probe or verify.
5	AOI-008	4/7/2016	Used pipe to spud the boat. Probed at the waypoint and two locations parallel to the boat. Found sediments over the cap in varying thicknesses. Underlying cap materials probed, more than 1.5 feet of the specified materials encountered. Granular cap materials with rock inclusions.
6	AOI-009 and 009a	4/7/2016	Used single pipe on the bow as a spud into soft sediments and motor to keep stern aligned. Probed 3 to 4 locations across bow and starboard side of the boat. Found 1 foot or more of soft sediments over the cap. Cap difficult to penetrate. One good probe through the cap shows more than 1.5 feet of aggregate, greater than the specified thickness.
7	AOI-009b	4/7/2016	Winds increasing with some chop. Probed waypoint and diagonals 2 feet away from waypoint to the north, south, east, and west. Found greater than 1 foot of soft to very soft sediments over the cap. Cap difficult to penetrate. One penetration had cap materials greater than 1.5 feet thick, greater than the specified thickness.
8	AOI-010	4/7/2016	Difficult to stay on station. Wait for lower tides and winds. Raked up the slope with the probe pipe, granular materials on the slope. Multiple attempts to stay on the waypoint. Probed within 5 feet of the point, confirmed cap at the specified thickness was below soft deposited sediments.
	Break	4/7/2016	Stopped to advise USEPA Dive Team of findings at AOI-3, 4, 8, and 9. Inquired about Dive Team's findings. Told Dive Team that 8, 9, 9a, and 9b had soft to very soft sediments over the cap.

Table 1
April 2016 Anchor QEA Probing Results

Location	USEPA Waypoint	Date	Notes
9	AOI-11 and 12	4/7/2016	Shown west of the cap limits; did not probe or verify.
10	AOI-15-2a, 15-2b, and 16	4/7/2016	Tides and north winds continue to reduce the water surface lower. Chose to work the shallow water areas along the shoreline. See the field notes and Figure 1 for the location. With multiple probes surrounding the boat, delineated an irregularly shaped natural depression. Found multiple layers of sand, soft sediments, and aggregate. The surface had 0.2 to 0.4 feet of aggregates intermixed with medium to fine sands and dark depositional materials. Larger aggregate encountered at 2, 3, and up to 5 feet into the sediment surface within the depression and the side slopes and "lip." Lip area was visible when reprobated with USEPA Diver Alisha Horrand. Shared a laptop image of the shoaling patterns in the area and photos from our previous inspections. Attempted to teach her probing techniques with metal and plastic pipe. More than 1 foot of cap materials encountered within the depression.
11	AOI-017	4/7/2016	Encountered greater than 1 foot of mixed sediments and aggregate, terminating into a cemented layer. Could not penetrate cemented rock layer. Probed four locations surrounding the waypoint with the same results.
12	AOI-018	4/7/2016	Probed four points surrounding the waypoint. Identified a mix of sands, deposited soft materials and aggregate in a natural depression. Total thickness of sand and aggregate cap material is greater than 1.5 feet.
	Break	4/7/2016	Shared sketch of "bowl or depressions" found and probe results with the USEPA Dive Team. Asked for their plan to continue their investigation through the weekend and into next week. Was informed by Brandi Todd that they were going to regroup with Gary Miller in Dallas on Monday and develop a plan to return and complete the inspection. <u>Stated that they were not trained on cap inspection.</u>
13	AOI-019	4/7/2016	Walked/waded 3 foot x 3 foot area of soft sediments, aggregate and sand. More than 1.0 feet of aggregate and sand cap materials found in a depressed area underneath 1-2 feet of dark deposited material. USEPA dive boat within 30 feet; pinged and raked rock surface with metal probe.
14	AOI-020	4/7/2016	Probed 2 foot x 2 foot area surrounding the waypoint. Similar to AOI-018, irregularly-shaped depression filled with more than one foot of sand and aggregate cap materials with overlying deposited materials.
15	AOI-021	4/7/2016	Appears to be the same location as AOI-20. Same results as AOI-20.

Table 2
May 2016 Anchor QEA Probing Results

USEPA Waypoint Location	Date	Thickness of Cap Material (feet)	Notes*
AOI-004	5/18/2016	1.25	15 inches of cap materials with 15 inches or more of soft alluvial silt overlying the cap materials.
AOI-003	5/18/2016	1.80	1 inch of cap materials at the waypoint. Found 12 to 22 inches of aggregate cap material on surrounding probes. From 22 to 48 inch depth on the probe, encountered silty sediment. Hard clay resistance at 48 inches
AOI-010	5/18/2016	>2.3	From sediment surface, encountered 28 inches of coarse aggregate and sand cap materials, then from 28 to 40 inches encountered sandy silt. Hard clay resistance at 40 inches
AOI-015-2B	5/18/2016	1.50	From sediment surface, encountered 18 inches granular cap materials surrounding a depression that is 12-15 feet in diameter. Depression is filled with silt deposition. Depression is 4-5 feet deep at center, terminating with more than 12 inches of aggregate and sand cap material
AOI-16	5/18/2016	1.50	18 inches aggregate and sand cap materials found with 18 inches to 5 feet of overlying silt. Hit refusal through the silt and cap materials at 5 feet
AOI-17	5/18/2016	1.50	18 inches of aggregate cap material over soft sediments. Aggregates not cemented
AOI-18	5/18/2016	1.25	15 inches of aggregate cap material over soft sediments. Aggregates not cemented
AOI-19	5/18/2016	1.16	14 inches of aggregate cap material in a depression with overlying 14 to 48 inches of sands mixed with alluvial silts
AOI-20	5/18/2016	1.50	18 inches of cap materials, partially cemented with overlying 18 to 24 inches of dark gray alluvial sediments mixed with sand
AOI-21	5/18/2016	2.00	24 inches of cap materials with inclusions of alluvial sediment. Difficult to determine thickness of sediment overlying the cap materials
AOI-22	5/18/2016	1.50	18 inches of aggregate and sand cap materials mixed with depositional material inclusions. 18 to 24 inches of overlying fine grain materials and sand that were dark gray
AOI-008	5/20/2016	1.50	18 inches of fine aggregate and sand cap material with more than 18 inches of overlying soft sediment. Probe completed into hard clay resistance
AOI-009B	5/20/2016	1.50	18 inches of aggregate and sand cap material with more than 18 inches of overlying sediment and clay mixture
AOI-009	5/20/2016	1.25	15 inches of aggregate cap material. Surrounding probes have 15 to 25 inches of aggregate mixed with sand; more than 25 inches of overlying soft sediments
AOI-009A	5/20/2016	1.16	14 inches of compacted aggregate cap material with more than 14 inches of overlying soft sediment

*General Note: Probing in A rock area; required cap thickness 1.0 foot, Cap material gradation is from fine sand up to 3 inch aggregate

FIGURES

Q:\Jobs\090557-01_San Jacinto_Waste Pits\Maps\2016_05\Divelnspection.mxd 1stfox 6/3/2016 9:20:12 AM



Figure 1
AOIs Identified during USEPA Dive Inspection
San Jacinto River Waste Pits Superfund Site

ATTACHMENT 1

EPA R6 DIVE TEAM OPERATIONS SUMMARY REPORT

EPA R6 Dive Team Operations SUMMARY REPORT

**San Jacinto Waste Pits
Channelview, TX
April 3 – 9, 2016**

This summary report covers the 2nd of four anticipated, interrelated diving operations at the San Jacinto River Waste Pits Superfund Site in Harris County, Texas where the I-10 crosses the San Jacinto River. This 2nd diving operation was a continuation of the December 2015 investigation and survey of the physical integrity of the multilayer impermeable cap installed over waste pits as part of the Time Critical Removal Action (TCRA); hereinafter referred to as the “TCRA Cap”.

The current investigation is designed to safely assess ongoing TCRA Cap integrity and performance as measured by the continued physical integrity of the cap and its boundaries. Divers and waders performed a Cap inspection, using visual and tactile means, to determine if the hard armor is remaining in place.

SUMMARY OF ACTIVITIES

4/4/16 – 4/9/2016 EPA utilized a Jon boat, staffed by a pilot and GPS operator, to deploy base and transect lines, along with buoys, to identify survey areas. The divers, directed by top side staff, descended to the river bed and reported presence or absence of rock. The divers probed substrate with rebar to assess the presence or absence of rock. If rebar was inserted its full length plus the length of the divers arm into the substrate (4-4.5ft.) without contacting a hard surface, the area was identified as not having rock present and was recorded as an ‘Area of Interest’. These locations were marked by GPS. Survey transect lines were 100-150ft long and placed 10ft apart. The diver surveyed 5ft on each side of the transect line, providing continuous survey coverage between transect lines. Probing resolution within transects was approximately 18 inches.

Areas assessed by wading were completed using PVC pipe or rebar as long as 10 ft. in length. Pipe and rebar were inserted into the substrate as deep as possible without being inserted below the surface of the water, allowing for approximately 5-6ft. penetration into the substrate. If pipe or rebar was inserted as deep as possible without contacting a hard surface, the area was identified as not having rock present, was recorded, and marked by GPS.

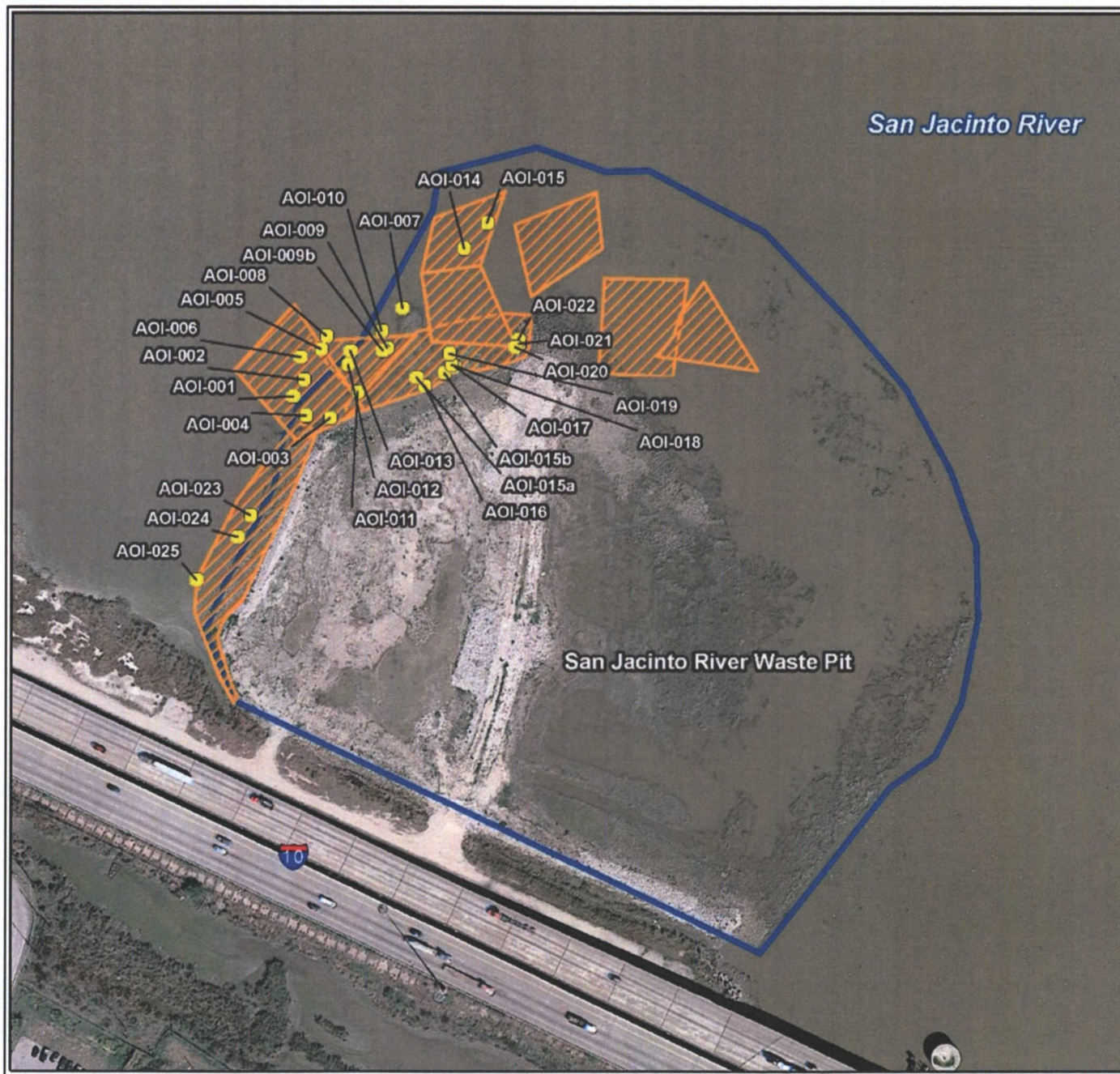
SUMMARY TABLE OF OBSERVATIONS

Grey rows indicate coordinate is outside of cap boundary

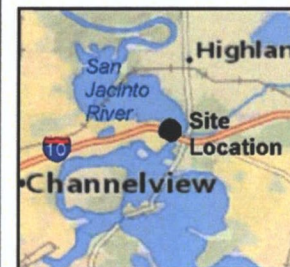
GPS coordinate ID	description of rock present	approx. surface dimensions	max detectable depth*	probing method	observations
AOI-001	no rock	5x5'	4-4.5'	diving	top 1.5' is very thick sediment. Outside of cap boundary based on attached map.
AOI-002	no rock	10' long or greater	4-4.5'	diving	Outside of cap boundary based on attached map.
AOI-003	sparse rock	not determined	5-6'	wading	
AOI-004	no rock	not determined due to depth of water	4-5'	wading	
AOI-005	sparse rock	15' long	4-5'	diving	2' thick sediment over gravel over sparse rock. GPS mark may not be not accrate. Outside cap boundary based on attached map.
AOI-006	no rock	20x20'	4-5'	diving	2' very thick sediment over gravel. Outside cap boundary based on attached map.
AOI-007	some gravel	3x3'	5-6'	wading	top 2-3' is thick sediment mixed with gravel. Not a full 12" of gravel. Grey sludge underneath loose gravel.
AOI-008	no rock	6-10' diameter	4-4.5'	diving	very thick/muddy sediment. Not flocculent. Outside cap boundary based on attached map.
AOI-009 & AOI-009b	sparse rock	5' wide. GPS coordinates mark lenth.	5-6'	wading	
AOI-010	no rock	3x3'	4-4.5'	diving	rock surrounding the area without rock.
AOI-011	some gravel	6x10'	5-6'	wading	sheen produced when probed.
AOI-012	sparse rock	5x5'	4-4.5'	diving	large rock surrounding the area without rock
AOI-013	no rock	6x2' possibly larger	4'	diving	
AOI-014	no rock	3x3'	greater than 5'	diving	rock surrounding the area without rock.
AOI-015	no rock	5x5'	greater than 4'	diving	possible geo membrane encountered. GPS coord may not be accurate.
AOI-015a & AOI-015b	no rock	20' long N to S. GPS coordinates mark E to W	5-6'	wading	largest area without rock
AOI-016	sparse rock	4x3'	mininum 4'	wading	
AOI-017	sparse rock	3x3'	5-6'	wading	
AOI-018	sparse rock	2x3'	5-6'	wading	
AOI-019	no rock	10x10'	5-6'	wading	
AOI-020	no rock	2x2'	greater than 6'	wading	
AOI-021	no rock		5-6'	wading	Possibly same area as AOI-020.
AOI-022	no rock	8x4'	5-6'	wading	rock surrounding the area without rock.
AOI-023	no rock		5-6'	wading	Outside cap boundary based on attached map.
AOI-024	no rock		5-6'	wading	Outside cap boundary based on attached map.
AOI-025	no rock		5-6'	wading	Outside cap boundary based on attached map.

* depth of area without rock may be deeper than values shown. Measurement of depth limited by length of probing devices and diver appendages.

MAP OF COORDINATES



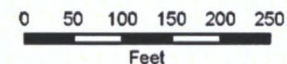
San Jacinto River Waste Pit
EPA Dive Team Survey, 4/2016
Harris County, TX



Legend

- Area of Interest
- Survey Area
- Cap Boundary

Sources:
EPA Region 6 Superfund, 4/2016;
GoogleEarth Pro 3/2016 Imagery.

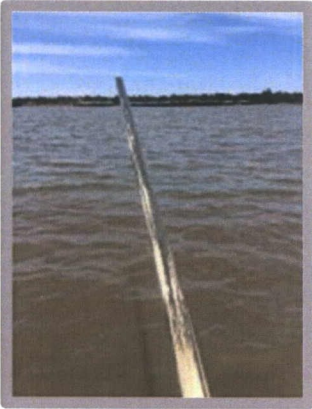


EPA Region 6
Superfund
GIS Support
5/19/2016



20160519M/L03

PHOTOGRAPHS



April 9, 2016

10 ft PVC pipe covered in sediment from probing between coordinates AOI-015a and AOI-015b. Sediment was very thick and gray in color.



April 9, 2016

Wading activity to determine the presence or absence of rock on the Cap. EPA diver inserted rebar and PVC pipe marking coordinates of AOI-015a and AOI-015b at the outer limits of an area without rock.



April 2016

Typical EPA Dive Team operations at San Jacinto. Diver in the water is connected by a communication line to the vessel on the right. The Jon boat is standing by to assist with diver entanglement, relocation of the transect line and GPS marking.